3720 ACM

3-Phase Power Instrumentation Package

- **Commercial/Industrial Metering**
- **Power Quality Monitoring**
- **SCADA**
- **Demand Management**

The 3720 ACM is a rugged, panel-mounted, 3-phase digital power monitoring instrument. It is an economical answer to the needs of power quality analysis, energy management and supervisory control for power utilities and industrial or commercial power distribution systems. The 3720 ACM can be used stand alone or as one element in a large energy management network.

Cost Effective
- Replaces dozens of separate meters
- Simple installation

Measurements
- True RMS voltage, current & power
- Continuous sampling

Data Logging
- Waveform and fault recording
- Scheduled or event-driven logging
- Min/Max logging
- Sequence of events logging

Extensive I/O
- 4 digital/counter inputs
- 3 digital relay outputs

Powerful Setpoint Control System
- Setpoint on any parameter or condition
- High-Speed response

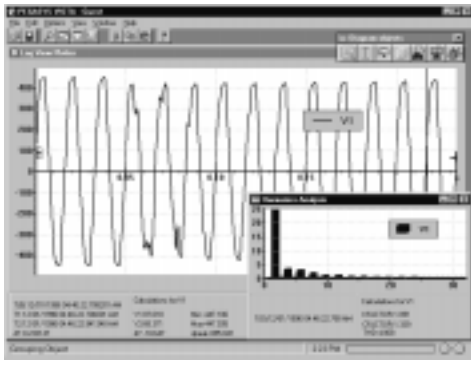
Communications
- Multiple ports
- Supports Modbus, Ethernet and DF-1

POWER MEASUREMENT

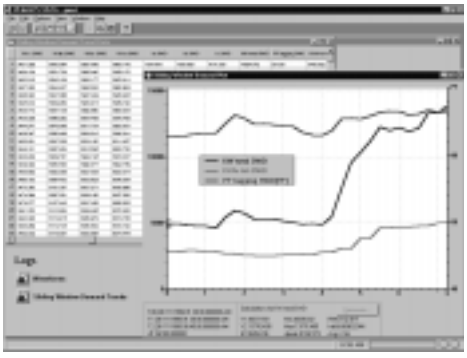
Metering

The 3720 ACM provides high accuracy true RMS measurements of voltage, current, power and energy readings, as well as minima, maxima, and status parameters. All parameters are quickly accessible via the front panel display or through the communications port. Voltage, current, power and energy readings are sensitive to beyond the 50th harmonic. Four-quadrant readings measure bidirectional (import/export) energy flow, useful in any cogeneration application.

Multi-cycle waveform recordings displayed in Power Measurement's PEGASYS software



Historical trend displayed in PEGASYS



Instantaneous

- Voltage (l-l/l-n), per phase & average
- Meter (Secondary) Volts & Amps
- Voltage & Current Unbalance
- Current, per phase & average
- Neutral Current
- Real, Reactive & Apparent Power, per phase and total
- Power Factor, per phase & total
- Frequency
- Auxiliary Voltage
- Phase Reversal

Energy

Real & reactive, imported, exported, total and net kWh & kVARh. Apparent energy, total kVAh.

Demand

- Thermal Demand for all instantaneous and Harmonic Distortion values
- Sliding Window & Predicted Demand calculated for up to 10 user selected parameters

Minimums and Maximums

Recorded for all base measurements, Thermal, Sliding Window, Predicted Demand and coincident values.

Time of Use

- 2 year internal calendar
- 16 profiles/day/calendar
- Up to ten tariffs can be defined, with up to 8 tariff changes/day
- 3 energy & 3 demand accumulators

Power Quality

The 3720 ACM measures individual harmonic distortion values for all voltage and current inputs for on-board power quality monitoring. High-resolution data can be used by Power Measurement's power monitoring software for detailed power quality analysis.
Store waveform recordings of short duration disturbances automatically for analysis of voltage sags and swells, ground faults, inrush and surge currents.

Harmonics

- Individual (1 to 15), total even, total odd, and total harmonics, and K-factor for all voltage and current inputs
- One full cycle of any voltage or current input sampled at 128 samples/cycle for software analysis

Waveform Recording

- Up to 36 cycles of all eight voltage & current inputs at 16 samples/cycle
- Programmable trigger delay to record pre-event and post-event waveform data
- Waveform data is saved until uploaded to a PC for analysis
- For 12 or 18 cycles, consecutive events can be recorded
- Display and compare multiple waveforms using Power Measurement's PEGASYS™ software

Logging & Recording

The 3720 ACM provides three types of on-board data logging: events, min/max levels, and snapshot readings are all automatically time-stamped and recorded in non-volatile memory. All logging functions are continuous and concurrent.

Using Power Measurement's software you can display all logged data. The software will automatically archive to disk all logged data retrieved from each device. The data can be converted to file formats compatible with other software.

Min/max values can also be viewed via the front panel.

Historical Logging

Produce daily/weekly/monthly load profile graphs for power, demand, power factor, or for time-of-use or billing calculations.

- Up to 8 individual logs, including one as a High-Speed Snapshot Log
- Record up to 12 channels of time-stamped data per log. Measured parameters recorded by each log are programmable
- Trigger at specified time intervals, 1 second to 400 days for standard logs, and 2 cycles to 36 minutes for the high-speed log
- Snapshot logs can be triggered or gated by standard setpoint conditions. Trigger functions are assigned independently for each log
- Internal snapshot memory is shared by all logs

Minimum/Maximum Logging

Records extreme values for system operations analysis, troubleshooting and problem tracking.

Preset Min/Max Log:

- Records extreme values for all measured parameters
- Minima/maxima for each parameter are logged independently with a date and time stamp @ 1 second resolution

Programmable Min/Max Logs:

- Up to 16 logs, each with up to 16 time-stamped parameters. Each log is triggered by the first parameter in its list
- Coincident values for all other list parameters are stored when a new extreme for the trigger parameter is detected
- Reset the logs from the front panel or via communications

Event Logging & Alarming

Records all setpoint/alarm conditions, relay operations, setup changes, and self-diagnostic events.

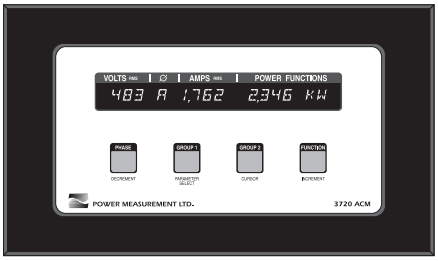
- Stores up to 100 date & time stamped records
- Time stamp resolution to 1 millisecond
- Synchronize to within 20 milliseconds between IEDs in the system using Power monitoring software
- Sequence-of-event recording

Front Panel Display

The front panel features an easy-to-read, 20-character vacuum fluorescent display. Voltage, current and power functions can all be displayed together for the selected phase. Voltage or current readings can be displayed for all three phases concurrently. The 3720 ACM may also be ordered with no front panel display for use as a digital power transducer.

- Four sealed membrane switches for parameter selection and programming
- Select voltage and current readings using the PHASE key
- Common power functions are available using the FUNCTION key
- Display two groupings of measurements and status parameters using the customizable GROUP 1/GROUP 2 keys
- Programming and control is password protected

3720 ACM Power Meter

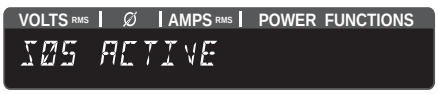


Vacuum Fluorescent Displays

Full Width Displays (e.g. kW, phase A, thermal demand, max.), up to 9 digits of resolution

3 Phase Displays

Status Input Condition



Setpoint Condition

Extensive I/O

Use the inputs to monitor utility KYZ initiators, device cycles, running hours, etc. Outputs can be used for equipment control, alarms, etc.

Status Inputs

- Four optically isolated, digital (status) inputs can monitor status, count pulses, or any other external dry contact

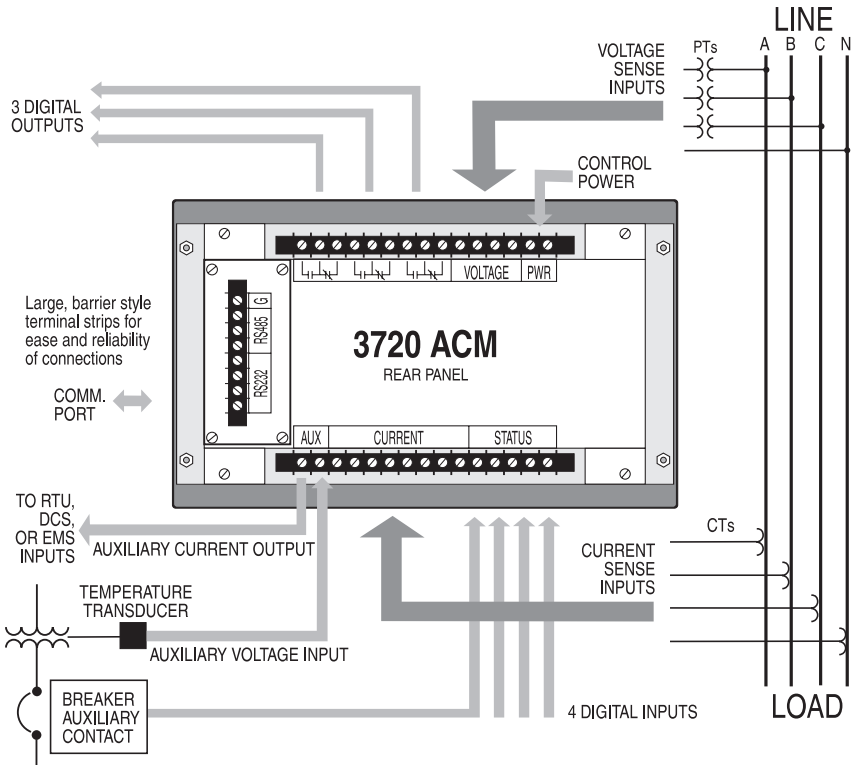
Relays

- 3 on-board relays controlled automatically by the internal setpoints or manually via a communications port
- Programmable for kWH, kVARH or kVAH output pulsing
- Form C mechanical relays rated at 10 A (AC or DC); or single-pole, single-throw solid state relays rated at 1 A (AC only)

Auxiliary Input/Output

- Auxiliary voltage input (0 to 1 VAC or VDC) measures external variables such as transformer temperature or battery voltage
- Auxiliary analog current output provides 0-20mA or 4-20 mA proportional to any measured parameter

Inputs and Outputs



Control

The 3720 ACM setpoint system provides intelligent logging and control functions.

Programmable Setpoint Control

Setpoints are defined by independent high and low trigger limits (for operate/release hysteresis), and time delays on both operate/release for the resulting function. Multiple setpoints can be channelled to a single relay ("OR" function) for multi-level setpoint protection functions.

- 11 standard setpoints, one second (typ.) response time
- 6 high-speed setpoints (33 ms typ. 66 ms max.) response
- Any setpoint condition can be set to control relays, trigger snapshot logs, record a waveform, or to clear/reset min/max logs, status counters, or TOU registers

Reliable Triggering

Voltage and current inputs are continuously monitored by the 3720 ACM, unaffected by other internal control, logging or communication operations. Critical short duration, setpoint-related events will always be detected. All setpoint activity is recorded automatically in the on-board Event Log.

Time-Overcurrent Operation

Overcurrent protection is provided using a programmable inverse time characteristic and a high speed setpoint. Programmed via the communications port.

- The fast response of the high-speed setpoints makes the 3720 ACM suitable for shadow protection on critical breakers

Communications

The 3720 ACM can be integrated within energy monitoring networks and supports a variety of protocols. Links between remote sites can use RS-485 or modems with telephone lines (dedicated or dial-up), fiber optic and/or radio links.

ISOCOM2 Communications Card

- Single optically isolated, transient protected port
- Data rates up to 19,200 bps.
- RS-232 or RS-485
- PML or Modicon Modbus protocols

Multi-port Communications Cards

Two multi-port communications cards are available, the MPCC and MPE. The table below describes the functionality of each communications card. All ports run concurrently.

The Alarm Dialer (AD) communication protocol enables the 3720 ACM to automatically contact a workstation/ASCII display station on the occurrence of an alarm condition. Each port can be configured as an AD, function independently and be configured to dial multiple workstations or ASCII display stations.

Software Integration

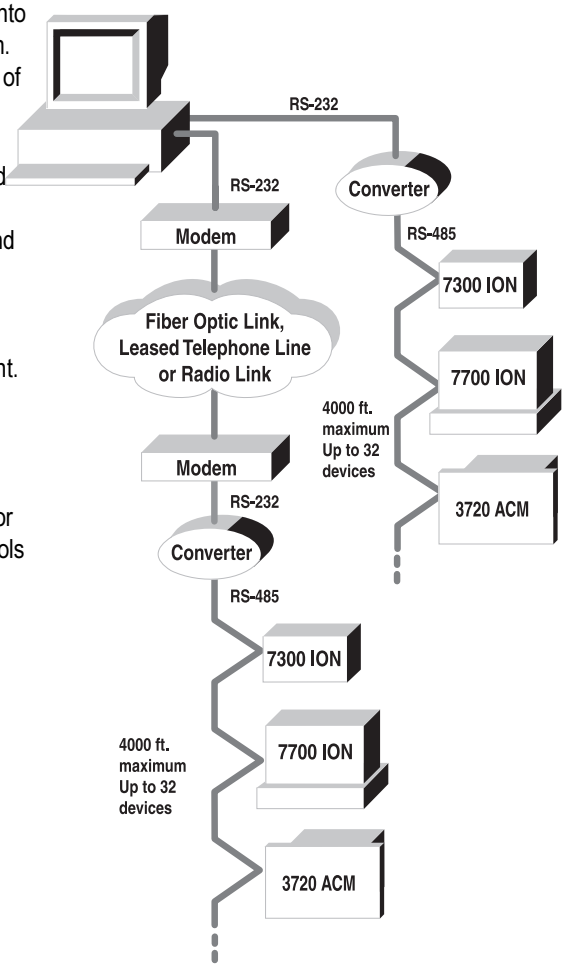
The 3720 ACM can be readily integrated into an energy management or SCADA system. Systems are easily expandable using any of the 3000 or 7000 series devices.

PEGASYS™

Power Measurement's Windows NT-based power monitoring software. PEGASYS displays both real-time and logged data and offers manual control and configuration capabilities. Its robust client-server architecture provides enterprise-wide data sharing in a secure networked environment.

SCADA Software

Power Measurement's economical DOS-based power monitoring software (M-SCADA, L-SCADA, and PowerView for DOS). Provides power quality analysis tools and advanced control capabilities within a secure access system.



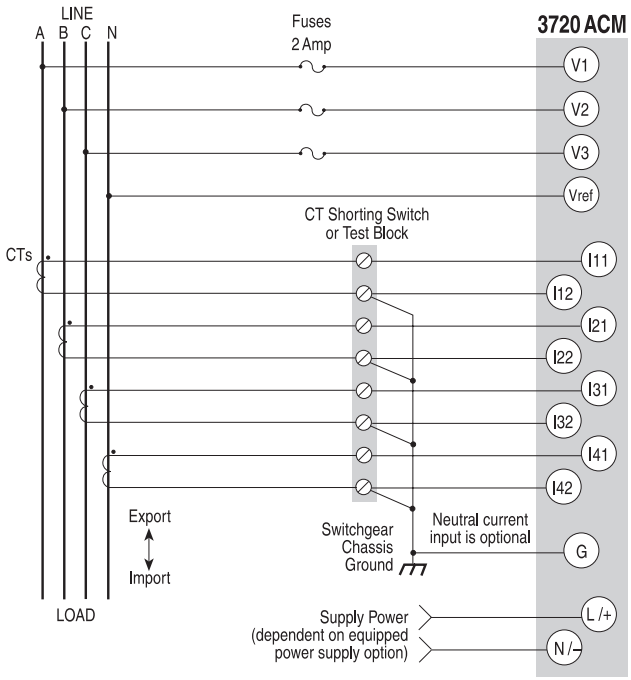
Multi-port Communications Cards

	MPCC	MPE*
RS-485 Port	2	1
RS-232 Port	1	1
Ethernet Port	-	1
Data Rates	up to 115.2 kbps	up to 115.2 kbps on RS-232/RS-485 up to 10 Mbps on Ethernet
Network Connection	via Ethernet/Serial converter	Direct connect to LAN, WAN, or Ethernet†
Protocols supported	PML, Modicon Modbus, Allen-Bradley DF-1 and Alarm Dialer	PML‡, Modicon Modbus‡, Allen-Bradley DF-1 and Alarm Dialer

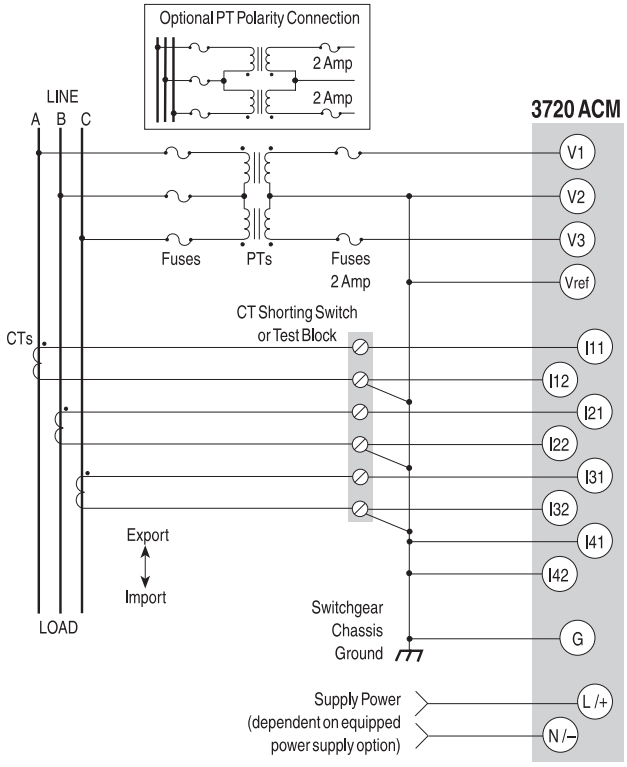
** The MPE Card uses TCP/IP enabling up to three concurrent connections. † Using more than one Ethernet connection excludes the use of one or both serial ports. ‡ Ethernet supports PML and Modicon Modbus protocols only.*

Example Connections

4-Wire Wye (Direct Connect)



3-Wire Delta (2 PTs and 3 CTs)



Connections

Installation

- 4-wire Wye, 3-wire Delta, and Single Phase systems
- 3 voltage and 3 current inputs
- 1 current input for neutral or ground current monitoring

Voltage & Current Inputs

- For systems up to 347 VAC line-to-neutral / 600 VAC line-to-line no PTs are required
- For higher voltage systems, PTs with 120 VAC secondaries must be used
- 5 A nominal full scale current inputs, (or optional 1 A current inputs) 300 A surge protection
- The basic model provides 125% current overrange capability. Current overrange options to 1000% are available

Control Power

The 3720 ACM can be powered from a dedicated fused feed, or from the voltage source it is monitoring.

Measurement Specifications

(Current and Power accuracies valid for Basic Model current overrange configuration only. See overrange chart for options)

Parameter	Accuracy‡ ±(% full scale)	Resolution	Range
Voltage	0.2 %	0.1 %	0 - 999,999*
Current (see options)	0.2 %	0.1 %	0 - 30,000
Neut/Gnd Current	0.2 %	0.1 %	0 - 9,999
kW	0.4 %	0.1 %	0 - 999,999†
kVAR	0.4 %	0.1 %	0 - 999,999†
kVA	0.4 %	0.1 %	0 - 999,999†
Power Factor	1.0 %	1.0 %	-0.6 to 1.0 to +0.6
Frequency	0.05 Hz	0.01 Hz	50, 60 Hz
kWH	0.4 %	1 kWH	0 - 999,999,999
kVARH	0.4 %	1 kVARH	0 - 999,999,999
kVAH	0.4 %	1 kVAH	0 - 999,999,999
V_{aux} (1 VAC scale)	0.25 %	0.1 %	0 - 999,999

* Reads in kV for voltages over 9,999. † Reads in MW, MVAR, MVA for readings over 9.999k.
‡ -XTEMP option: derate accuracy by 0.01% per °C below 0°C and above 50°C.

Current Overrange Options

Option	Amps Accuracy	Power Accuracy	Current Input Overrange		
			% Full Scale	Amps	
				Std.	1AMP
Basic Model	0.2 %	0.4 %	125%	6.25	1.25
XAMPS	0.3 %	0.5 %	200%	10.00	2.00
YAMPS	0.8 %	1.0 %	500%	25.00	5.00
ZAMPS	2.0 %	2.5 %	1000%	50.00	10.00

Waveform Capture & Recording

	Sampling Rate	Accuracy	Resolution
Waveform Capture	8 kHz† (128 times/cycle)	2% of full scale	10 bits (0.1 %)
Waveform Recording	1 kHz† (16 times/cycle)	2% of full scale	10 bits (0.1 %)

† Approximate

User Programmable Log Capacity

Example configurations

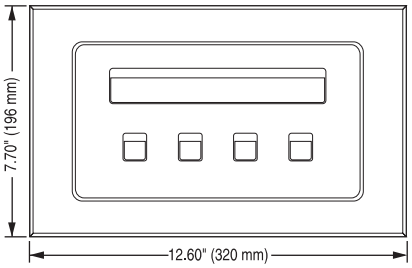
Memory Configuration	# of Logs	Parameters per Log	Interval	Capacity
Single Log using all log memory	1 Log	3	15 minutes	48 days
Single Log using all log memory	1 Log	12	15 minutes	16 days
3 Logs sharing all log memory	2 Logs 1 Log	4 5	15 minutes 1 hour	12 days 40 days

Mounting

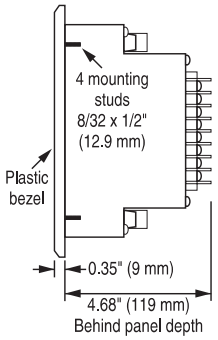
The 3720 ACM can be panel-mounted in a switchgear cabinet or other location for easy access and viewing.

- Mounted flush against any flat surface
- Only a single cutout is required

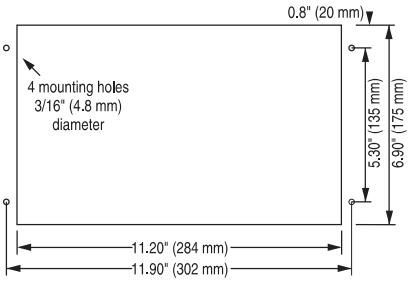
Front View



Side View



Cutout (display & Tran model)



POWER MEASUREMENT

Meet the World Leader

For over two decades, Power Measurement has been providing cost-effective power monitoring, analysis, and control systems to customers around the globe including power utilities, commercial and industrial facilities, and major electrical OEMs. Let our experience and proven track record give you an end-to-end energy management solution that exceeds your expectations.

POWER MEASUREMENT

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Officially Registered

ISO 9000 INTERNATIONAL QUALITY ASSURANCE STANDARD

Input & Output Ratings

Voltage Inputs

- Basic: 120 line-to-neutral / 208 line-to-line nominal full scale input
- 277 Option: 277 VAC nominal full scale input
- 347 Option: 347 VAC nominal full scale input
- All options: Overload withstand: 1500 VAC continuous, 2500 VAC for 1 second. Input impedance for all options: 2 MΩ

Current Inputs

- Basic: 5.0 Amps AC nominal full scale input
- 1AMP Option: 1.0 Amp AC nominal full scale
- All options: Overload withstand 15 Amps continuous, 300 Amps for 1 second. Input impedance: 0.002Ω
- Burden: 0.05 VA

Aux. Voltage Input

- 1.0 VAC/VDC nominal full scale input (1.25 VAC /VDC max.) Overload withstand: 120 VAC/VDC continuous, 1000 VAC/VDC for 1 second. Input impedance: 10 KΩ

Aux. Current Output

- 0 to 20 mA into max. 250W load. Accuracy: 2 %

Control Relays

- Basic: Form C dry contact electromechanical relays, max. 277 VAC or 30 VDC @ 10 Amp resistive
- SSR Option: SPST solid state relays, 24 to 280 VAC @ 1 Amp AC resistive (AC operation only)

Status Inputs

- Self-excited, dry contact sensing. No external voltage source required.
- +30 VDC differential SCOM output to S1, S2, S3, or S4 input
- Minimum Pulse Width: 40 msec.

Power Supply

- Basic: 85 to 264 VAC / 47 to 440 Hz or 110 to 300 VDC @ 0.2 Amps
- P24/48 Option: 20 to 60 VDC @ 10W

Environmental Conditions

Operating Temp: 0°C to 50°C (32°F to 122°F) ambient air

(XTEMP Option): -20°C to +70°C (-4°F to +158°F)

Storage Temp: -30°C to +70°C (-22°F to +158°F)

Humidity 5 to 95 %, non-condensing

Shipping

- 3.9 kg (8 lb, 10 oz)
- 38 x 25 x 18 cm (15" x 9.8" x 7.1")

Standards Compliance

Voltage, Current, Status, Relay and Power inputs all pass the ANSI/ IEEE C37.90A-1989 surge withstand and fast transient tests.

LR 57329

LISTED INDUSTRIAL CONTROL EQUIPMENT 1T98

EURO MODEL ONLY

Ordering Information

Models

3720ACM	includes front panel display
3720ACM-TRAN	without display

Meter Options

(specify when ordering)

277	To monitor 277/480 Volts (instead of 120/208 Volts)
347	To monitor 347/600 Volts (instead of 120/208 Volts)
1AMP	1 Amp nominal full scale current inputs
XAMPS	200% overrange capability on current inputs
YAMPS	500% overrange capability on current inputs
ZAMPS	1000% overrange capability on current inputs
SSR	SPST solid state relays (instead of Form C electronic mechanical)
P24/48	20 to 60 VDC power supply (instead of 85 to 264 VAC / 110 to 300 VDC)
EURO	CE model
MPCC	Multiport comm card with 1 RS-232 port and 2 RS-485 ports
MPE	Multiport comm card with 1 RS-232 port, 1 RS-485 port and 1 Ethernet port.
XTEMP	Extended operating temp. range: -20°C to +70°C (-4°F to +158°F)
TROP	Tropicalization (conformal coating) treatment
RACK	19 inch rack mount panel

Ordering Example

This example specifies a 3720 ACM with the -277 volts option and 200% overrange capability on current inputs

3720ACM -277 -XAMPS

Warranty

3 years limited parts and labour, F.O.B. Saanichton, B.C., CANADA